Screen Math data with elementary tests

```
/* readmath.sas   Just read the data and do basic transformations */
options linesize=79 noovp formdlim='_';
title 'Gender, Ethnicity and Math performance';

proc format;
     value ynfmt  0 = 'No'  1 = 'Yes';
     value crsfmt   4 = 'No Resp';
     value nfmt
                1 = 'Asian'
                2 = 'Eastern European'
                3 = 'European not Eastern'
                4 = 'Middle-Eastern  and Pakistani'
                5 = 'East Indian'
                6 = 'Other   and DK' ;

data math;
     infile 'exploremath.data';
     input id course precalc calc gpa calculus english mark lang $ sex $
           nation1 nation2 sample;

/* Computed Variables: totscore, passed, grade, hsgpa, hscalc, hsengl,
                       tongue, ethnic */

     totscore = precalc+calc;
     if (50<=mark<=100) then passed=1; else passed=0;
     /* Some missing final marks were zero, and 998=SDF and 999=WDR */
     if mark=0 then grade=.;
        else if mark > 100 then grade=.;
        else grade=mark;
     /* Missing HS marks were zeros */
     if 65 le gpa le 100 then hsgpa = gpa; /* Else missing is automatic */
     if 0 < calculus < 101 then hscalc = calculus;
     if 0 < english < 101 then hsengl = english;
     /* There were just a few French speakers */
     if lang='French' then tongue='Other  '; else tongue=lang;
     label tongue = 'Mother Tongue (Eng or Other)';
     /* Rater 1 knows Middle Eastern names -- otherwise believe Rater 2 */
     if nation1=4 then ethnic=nation1; else ethnic=nation2;

     label
           precalc  = 'Number precalculus correct'
           calc  = 'Number calculus correct'
           totscore = 'Total # right on diagnostic test'
           passed = 'Passed the course'
           grade = 'Final mark (if any)'
           hsgpa = 'High School GPA'
           hscalc = 'HS Calculus'
           hsengl = 'HS English'
           lang = 'Mother Tongue'
           nation1 = 'Nationality of name acc to rater1'
           nation2 = 'Nationality of name acc to rater2'
           tongue = 'Mother Tongue (Eng or Other)'
           ethnic = 'Judged Nationality of name';

     format course crsfmt.; format passed ynfmt.; format nation1 nation2 ethnic nfmt.;
```

```
/* basicmath.sas */
title2 'Explore math data with elementary tests';
%include 'readmath.sas';

/* It's not the primary question, but are marks better on the precalculus
items of the diagnostic test, or the calculus items? There are 9 precalculus
and 11 calculus questions; convert to percentages. The data step
continues ... */

diff = (100 * precalc/9) - (100 * calc/11);
label diff = 'Percentage correct: Precalc minus calc';

/* And a couple more useful variables */
if course=4 then course2=.; else course2=course; /* Eliminate 'No Resp' */
if 0 le grade le 60 then gsplit='60orLess';
   else if 60 lt grade le 100 then gsplit='Over60';
   /* Got median=60 from proc univariate */
label gsplit = 'Median split on final grade';

proc freq; tables grade*gsplit / norow nocol nopercent missing;

proc means n mean std t probt clm;
     title2 'Are precalculus questions easier?';
     var diff;

/* Do the following quantitative variables have a significant linear
relationship with grade? What percent of the variation does each explain?
     * High school GPA
     * High school Calculus mark
     * High school English mark
     * Number precalculus correct on diagnostic test
     * Number calculus correct on diagnostic test
     * Total number correct on diagnostic test
*/

proc corr nosimple;
     title2 'Predict grade from quantitative variables';
     var grade hsgpa hscalc hsengl precalc calc totscore;

proc corr spearman nosimple;
     title2 'Should we worry about normality?';
     var grade;
      with hsgpa hscalc hsengl precalc calc totscore;

proc plot;
     title2 'University Calculus Grade by HS GPA';
     plot grade * hsgpa;

proc reg;
     title2 'Give an equation for predicting calculus grade from HS GPA';
     model grade = hsgpa;
```

```
proc glm;
     title2 'Do average marks differ significantly in the three courses?';
     class course2;
     model grade = course2;
     means course2;
     /* Also, what proportion of the variation in grade is explained by
        course? */

proc glm;
     title2 'Is there a sex difference in average marks?';
     class sex;
     model grade = sex;
     means sex;
     /* Also, what proportion of the variation in grade is explained by
        sex? */

proc ttest;
     title2 'Could we conclude NO sex difference?';
     class sex;
     var grade;
     /* Find confidence interval for difference between means. */

proc glm;
     title2 'Do average marks depend on mother tongue?';
     class tongue;
     model grade = tongue;
     means tongue;
     /* Also, what proportion of the variation in grade is explained by
        mother tongue? */

proc glm;
     title2 'Do average marks depend on ethnic background?';
     class ethnic;
     model grade = ethnic;
     means ethnic;
     means ethnic / tukey bon scheffe;
     /* Also, what proportion of the variation in grade is explained by
        ethnic background? */

proc freq;
     title2 'A few Chisquare tests to predict passed';
     tables (course2 sex ethnic tongue) * passed / nocol nopercent chisq;

proc freq;
     title2 'Median tests';
     tables (course2 sex ethnic tongue) * gsplit / nocol nopercent chisq;
```

Skipping the huge table of grade by gsplit ...

Gender, Ethnicity and Math performance 5
Are precalculus questions easier?

The MEANS Procedure

Analysis Variable : diff Percentage correct: Precalc minus calc

N	Mean	Std Dev	t Value	Pr > |t|	Lower 95% CL for Mean	Upper 95% CL for Mean
480	18.7415825	21.2553367	19.32	<.0001	16.8352695	20.6478955

Gender, Ethnicity and Math performance 6
Predict grade from quantitative variables

The CORR Procedure

7 Variables: grade hsgpa hscalc hsengl precalc calc totscore

Pearson Correlation Coefficients
Prob > |r| under H0: Rho=0
Number of Observations

	grade	hsgpa	hscalc	hsengl
grade	1.00000	0.58129	0.53272	0.16441
Final mark		<.0001	<.0001	0.0022
	393	337	332	345
hsgpa	0.58129	1.00000	0.62249	0.54327
High School GPA	<.0001		<.0001	<.0001
	337	466	437	464
hscalc	0.53272	0.62249	1.00000	0.08498
HS Calculus	<.0001	<.0001		0.0749
	332	437	448	440
hsengl	0.16441	0.54327	0.08498	1.00000
HS English	0.0022	<.0001	0.0749	
	345	464	440	480

Pearson Correlation Coefficients
Prob > |r| under H0: Rho=0
Number of Observations

	precalc	calc	totscore
grade	0.37834	0.36247	0.42847
Final mark	<.0001	<.0001	<.0001
	346	346	346

hsgpa	0.33965	0.33876	0.39002
High School GPA	<.0001	<.0001	<.0001
	396	396	396
hscalc	0.36684	0.43774	0.47262
HS Calculus	<.0001	<.0001	<.0001
	384	384	384
hsengl	0.06543	0.04272	0.05995
HS English	0.1893	0.3917	0.2293
	404	404	404

Predict grade from quantitative variables

The CORR Procedure

Pearson Correlation Coefficients
Prob > |r| under H0: Rho=0
Number of Observations

	grade	hsgpa	hscalc	hsengl
precalc	0.37834	0.33965	0.36684	0.06543
Number precalculus correct	<.0001	<.0001	<.0001	0.1893
	346	396	384	404
calc	0.36247	0.33876	0.43774	0.04272
Number calculus correct	<.0001	<.0001	<.0001	0.3917
	346	396	384	404
totscore	0.42847	0.39002	0.47262	0.05995
Total # right on diagnostic test	<.0001	<.0001	<.0001	0.2293
	346	396	384	404

Pearson Correlation Coefficients
Prob > |r| under H0: Rho=0
Number of Observations

	precalc	calc	totscore
precalc	1.00000	0.50135	0.81309
Number precalculus correct		<.0001	<.0001
	480	480	480
calc	0.50135	1.00000	0.91133
Number calculus correct	<.0001		<.0001
	480	480	480
totscore	0.81309	0.91133	1.00000
Total # right on diagnostic test	<.0001	<.0001	
	480	480	480

The CORR Procedure

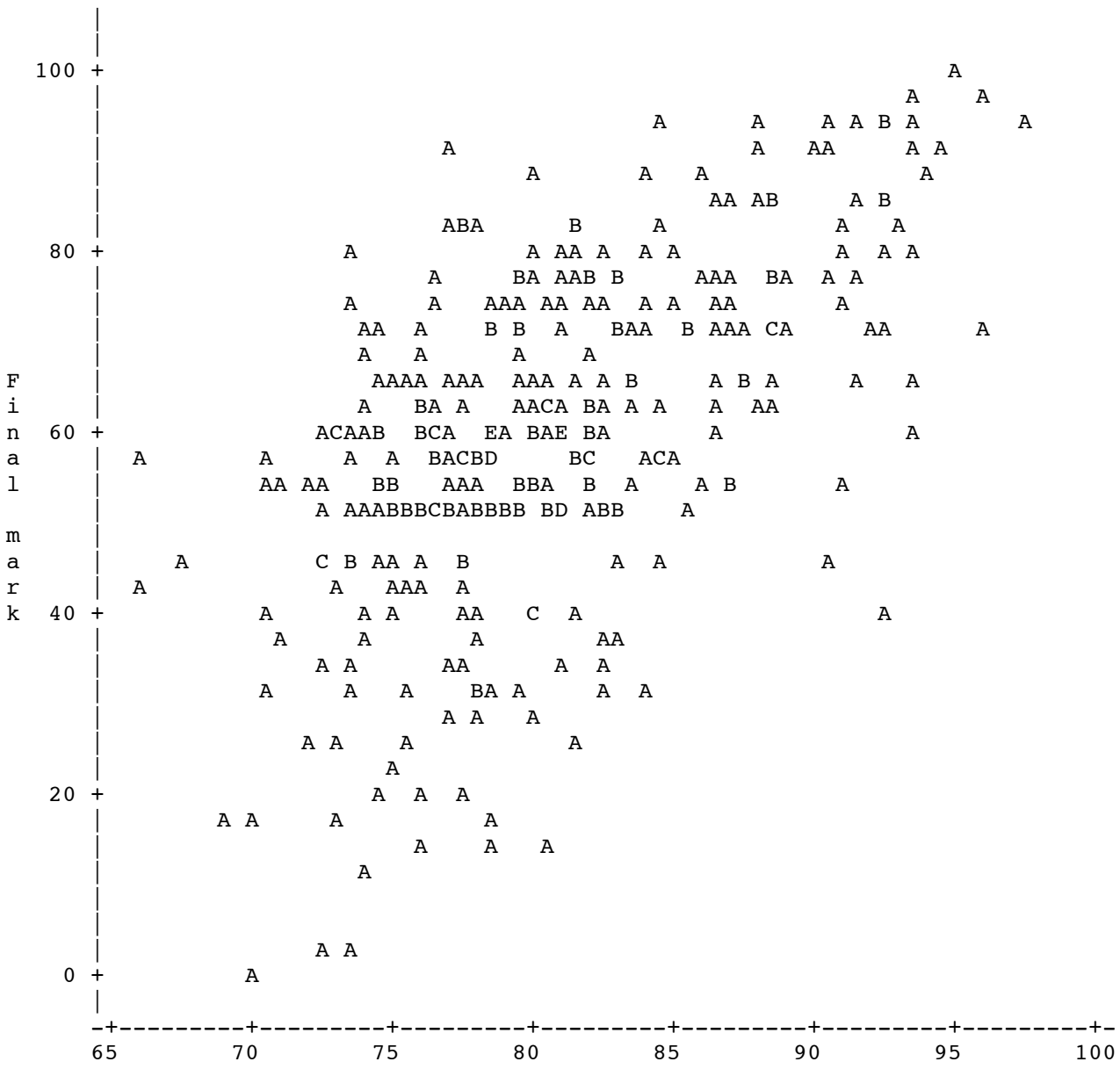
6 With Variables: hsgpa hscalc hsengl precalc calc totscore
1 Variables: grade

Spearman Correlation Coefficients
Prob > |r| under H0: Rho=0
Number of Observations

	grade
hsgpa High School GPA	0.55825 <.0001 337
hscalc HS Calculus	0.58847 <.0001 332
hsengl HS English	0.17970 0.0008 345
precalc Number precalculus correct	0.35195 <.0001 346
calc Number calculus correct	0.34462 <.0001 346
totscore Total # right on diagnostic test	0.39039 <.0001 346

University Calculus Grade by HS GPA

Plot of grade*hsgpa. Legend: A = 1 obs, B = 2 obs, etc.



NOTE: 242 obs had missing values.

Give an equation for predicting calculus grade from HS GPA

The REG Procedure
Model: MODEL1
Dependent Variable: grade Final mark

Number of Observations Read	579
Number of Observations Used	337
Number of Observations with Missing Values	242

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	1	39116	39116	170.97	<.0001
Error	335	76644	228.78925		
Corrected Total	336	115760			

Root MSE	15.12578	R-Square	0.3379
Dependent Mean	59.28190	Adj R-Sq	0.3359
Coeff Var	25.51501		

Parameter Estimates

Variable	Label	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	Intercept	1	-84.85069	11.05385	-7.68	<.0001
hsgpa	High School GPA	1	1.78889	0.13681	13.08	<.0001

The GLM Procedure

Class Level Information

Class	Levels	Values
course2	3	1 2 3

Number of Observations Read 579
Number of Observations Used 346

The GLM Procedure

Dependent Variable: grade Final mark

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	612.6624	306.3312	0.84	0.4317
Error	343	124775.1873	363.7761		
Corrected Total	345	125387.8497			

R-Square	Coeff Var	Root MSE	grade Mean
0.004886	32.03198	19.07291	59.54335

Source	DF	Type I SS	Mean Square	F Value	Pr > F
course2	2	612.6623710	306.3311855	0.84	0.4317

Source	DF	Type III SS	Mean Square	F Value	Pr > F
course2	2	612.6623710	306.3311855	0.84	0.4317

Gender, Ethnicity and Math performance 13
Do average marks differ significantly in the three courses?

The GLM Procedure

Level of course2	N	grade Mean	grade Std Dev
1	24	54.7500000	21.8955028
2	285	59.8105263	18.5206174
3	37	60.5945946	21.3000515

Gender, Ethnicity and Math performance 14
Is there a sex difference in average marks?

The GLM Procedure

Class Level Information

Class	Levels	Values
sex	2	Female Male

Number of Observations Read 579
Number of Observations Used 383

Gender, Ethnicity and Math performance 15
Is there a sex difference in average marks?

The GLM Procedure

Dependent Variable: grade Final mark

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	1	110.7945	110.7945	0.30	0.5870
Error	381	142806.7564	374.8209		
Corrected Total	382	142917.5509			

R-Square	Coeff Var	Root MSE	grade Mean
0.000775	33.00246	19.36029	58.66319

Source	DF	Type I SS	Mean Square	F Value	Pr > F
sex	1	110.7945190	110.7945190	0.30	0.5870

Source	DF	Type III SS	Mean Square	F Value	Pr > F
sex	1	110.7945190	110.7945190	0.30	0.5870

Is there a sex difference in average marks?

The GLM Procedure

Level of sex	N	grade Mean	grade Std Dev
Female	193	58.1295337	18.4319923
Male	190	59.2052632	20.2598196

Could we conclude NO sex difference?

The TTEST Procedure

Statistics

Variable	sex	N	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev
grade	Female	193	55.513	58.13	60.746	16.758	18.432
grade	Male	190	56.306	59.205	62.105	18.407	20.26
grade	Diff (1-2)		-4.966	-1.076	2.8146	18.078	19.36

Statistics

Variable	sex	Upper CL Std Dev	Std Err	Minimum	Maximum
grade	Female	20.48	1.3268	4	97
grade	Male	22.531	1.4698	1	99
grade	Diff (1-2)	20.84	1.9786		

T-Tests

Variable	Method	Variances	DF	t Value	Pr > |t|
grade	Pooled	Equal	381	-0.54	0.5870
grade	Satterthwaite	Unequal	376	-0.54	0.5873

Equality of Variances

Variable	Method	Num DF	Den DF	F Value	Pr > F
grade	Folded F	189	192	1.21	0.1926

Gender, Ethnicity and Math performance 18
Do average marks depend on mother tongue?

The GLM Procedure

Class Level Information

Class	Levels	Values
tongue	2	English Other

Number of Observations Read 579
Number of Observations Used 383

Gender, Ethnicity and Math performance 19
Do average marks depend on mother tongue?

The GLM Procedure

Dependent Variable: grade Final mark

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	1	2064.4317	2064.4317	5.58	0.0186
Error	381	140853.1192	369.6932		
Corrected Total	382	142917.5509			

R-Square	Coeff Var	Root MSE	grade Mean
0.014445	32.77594	19.22741	58.66319

Source	DF	Type I SS	Mean Square	F Value	Pr > F
tongue	1	2064.431684	2064.431684	5.58	0.0186

Source	DF	Type III SS	Mean Square	F Value	Pr > F
tongue	1	2064.431684	2064.431684	5.58	0.0186

The GLM Procedure

Level of tongue	N	grade Mean	grade Std Dev
English	289	57.3391003	19.2338287
Other	94	62.7340426	19.2075117

The GLM Procedure

Class Level Information

Class	Levels	Values
ethnic	6	Asian East Indian Eastern European European not Eastern Middle-Eastern and Pakistani Other and DK

Number of Observations Read 579
Number of Observations Used 393

The GLM Procedure

Dependent Variable: grade Final mark

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	3640.9573	728.1915	2.00	0.0772
Error	387	140613.0478	363.3412		
Corrected Total	392	144254.0051			

R-Square	Coeff Var	Root MSE	grade Mean
0.025240	32.45180	19.06151	58.73791

Source	DF	Type I SS	Mean Square	F Value	Pr > F
ethnic	5	3640.957278	728.191456	2.00	0.0772

Source	DF	Type III SS	Mean Square	F Value	Pr > F
ethnic	5	3640.957278	728.191456	2.00	0.0772

The GLM Procedure

Level of ethnic	N	grade Mean	grade Std Dev
Asian	87	60.0574713	20.9314253
East Indian	53	65.1886792	18.5317364
Eastern European	46	55.7608696	20.2771736
European not Eastern	142	56.2816901	17.8581353
Middle-Eastern and Pakistani	50	59.3600000	19.9691190
Other and DK	15	58.6000000	12.1526011

The GLM Procedure

Tukey's Studentized Range (HSD) Test for grade

NOTE: This test controls the Type I experimentwise error rate.

Alpha	0.05
Error Degrees of Freedom	387
Error Mean Square	363.3412
Critical Value of Studentized Range	4.05040

Comparisons significant at the 0.05 level are indicated by ***.

ethnic Comparison			Difference Between Means
East Indian		- Asian	5.131
East Indian		- Middle-Eastern and Pakistani	5.829
East Indian		- Other and DK	6.589
East Indian		- European not Eastern	8.907
East Indian		- Eastern European	9.428
Asian		- East Indian	-5.131
Asian		- Middle-Eastern and Pakistani	0.697
Asian		- Other and DK	1.457
Asian		- European not Eastern	3.776
Asian		- Eastern European	4.297
Middle-Eastern and Pakistani		- East Indian	-5.829
Middle-Eastern and Pakistani		- Asian	-0.697
Middle-Eastern and Pakistani		- Other and DK	0.760
Middle-Eastern and Pakistani		- European not Eastern	3.078
Middle-Eastern and Pakistani		- Eastern European	3.599
Other and DK		- East Indian	-6.589
Other and DK		- Asian	-1.457
Other and DK		- Middle-Eastern and Pakistani	-0.760
Other and DK		- European not Eastern	2.318
Other and DK		- Eastern European	2.839
European not Eastern		- East Indian	-8.907
European not Eastern		- Asian	-3.776
European not Eastern		- Middle-Eastern and Pakistani	-3.078
European not Eastern		- Other and DK	-2.318
European not Eastern		- Eastern European	0.521
Eastern European		- East Indian	-9.428
Eastern European		- Asian	-4.297
Eastern European		- Middle-Eastern and Pakistani	-3.599
Eastern European		- Other and DK	-2.839
Eastern European		- European not Eastern	-0.521

The GLM Procedure

Tukey's Studentized Range (HSD) Test for grade

Comparisons significant at the 0.05 level are indicated by ***.

ethnic Comparison		Simultaneous 95% Confidence Limits	
East Indian	- Asian	-4.382	14.644
East Indian	- Middle-Eastern and Pakistani	-4.934	16.592
East Indian	- Other and DK	-9.378	22.555
East Indian	- European not Eastern	0.119	17.695
East Indian	- Eastern European	-1.573	20.429
Asian	- East Indian	-14.644	4.382
Asian	- Middle-Eastern and Pakistani	-8.991	10.386
Asian	- Other and DK	-13.805	16.720
Asian	- European not Eastern	-3.657	11.209
Asian	- Eastern European	-5.656	14.249
Middle-Eastern and Pakistani	- East Indian	-16.592	4.934
Middle-Eastern and Pakistani	- Asian	-10.386	8.991
Middle-Eastern and Pakistani	- Other and DK	-15.312	16.832
Middle-Eastern and Pakistani	- European not Eastern	-5.899	12.056
Middle-Eastern and Pakistani	- Eastern European	-7.554	14.753
Other and DK	- East Indian	-22.555	9.378
Other and DK	- Asian	-16.720	13.805
Other and DK	- Middle-Eastern and Pakistani	-16.832	15.312
Other and DK	- European not Eastern	-12.503	17.140
Other and DK	- Eastern European	-13.393	19.071
European not Eastern	- East Indian	-17.695	-0.119
European not Eastern	- Asian	-11.209	3.657
European not Eastern	- Middle-Eastern and Pakistani	-12.056	5.899
European not Eastern	- Other and DK	-17.140	12.503
European not Eastern	- Eastern European	-8.741	9.783
Eastern European	- East Indian	-20.429	1.573
Eastern European	- Asian	-14.249	5.656
Eastern European	- Middle-Eastern and Pakistani	-14.753	7.554
Eastern European	- Other and DK	-19.071	13.393
Eastern European	- European not Eastern	-9.783	8.741

```
  Comparisons significant at the 0.05 level are indicated by ***.


                          ethnic
                        Comparison

East Indian                   - Asian
East Indian                   - Middle-Eastern  and Pakistani
East Indian                   - Other   and DK
East Indian                   - European not Eastern            ***
East Indian                   - Eastern European
Asian                         - East Indian
Asian                         - Middle-Eastern  and Pakistani
Asian                         - Other   and DK
Asian                         - European not Eastern
Asian                         - Eastern European
Middle-Eastern  and Pakistani - East Indian
Middle-Eastern  and Pakistani - Asian
Middle-Eastern  and Pakistani - Other   and DK
Middle-Eastern  and Pakistani - European not Eastern
Middle-Eastern  and Pakistani - Eastern European
Other   and DK                - East Indian
Other   and DK                - Asian
Other   and DK                - Middle-Eastern  and Pakistani
Other   and DK                - European not Eastern
Other   and DK                - Eastern European
European not Eastern          - East Indian                     ***
European not Eastern          - Asian
European not Eastern          - Middle-Eastern  and Pakistani
European not Eastern          - Other   and DK
European not Eastern          - Eastern European
Eastern European              - East Indian
Eastern European              - Asian
Eastern European              - Middle-Eastern  and Pakistani
Eastern European              - Other   and DK
Eastern European              - European not Eastern
```

We get exactly the same kind of output for the Bonferroni and Scheffe comparisons. Just display the pages corresponding to this one, showing which differences are significant by the follow-up tests.

The GLM Procedure

Bonferroni (Dunn) t Tests for grade

Comparisons significant at the 0.05 level are indicated by ***.

ethnic Comparison	
East Indian	- Asian
East Indian	- Middle-Eastern and Pakistani
East Indian	- Other and DK
East Indian	- European not Eastern
East Indian	- Eastern European
Asian	- East Indian
Asian	- Middle-Eastern and Pakistani
Asian	- Other and DK
Asian	- European not Eastern
Asian	- Eastern European
Middle-Eastern and Pakistani	- East Indian
Middle-Eastern and Pakistani	- Asian
Middle-Eastern and Pakistani	- Other and DK
Middle-Eastern and Pakistani	- European not Eastern
Middle-Eastern and Pakistani	- Eastern European
Other and DK	- East Indian
Other and DK	- Asian
Other and DK	- Middle-Eastern and Pakistani
Other and DK	- European not Eastern
Other and DK	- Eastern European
European not Eastern	- East Indian
European not Eastern	- Asian
European not Eastern	- Middle-Eastern and Pakistani
European not Eastern	- Other and DK
European not Eastern	- Eastern European
Eastern European	- East Indian
Eastern European	- Asian
Eastern European	- Middle-Eastern and Pakistani
Eastern European	- Other and DK
Eastern European	- European not Eastern

The GLM Procedure

Scheffe's Test for grade

NOTE: This test controls the Type I experimentwise error rate, but it generally has a higher Type II error rate than Tukey's for all pairwise comparisons.

Alpha	0.05
Error Degrees of Freedom	387
Error Mean Square	363.3412
Critical Value of F	2.23731

Comparisons significant at the 0.05 level are indicated by ***.

ethnic Comparison		
East Indian	-	Asian
East Indian	-	Middle-Eastern and Pakistani
East Indian	-	Other and DK
East Indian	-	European not Eastern
East Indian	-	Eastern European
Asian	-	East Indian
Asian	-	Middle-Eastern and Pakistani
Asian	-	Other and DK
Asian	-	European not Eastern
Asian	-	Eastern European
Middle-Eastern and Pakistani	-	East Indian
Middle-Eastern and Pakistani	-	Asian
Middle-Eastern and Pakistani	-	Other and DK
Middle-Eastern and Pakistani	-	European not Eastern
Middle-Eastern and Pakistani	-	Eastern European
Other and DK	-	East Indian
Other and DK	-	Asian
Other and DK	-	Middle-Eastern and Pakistani
Other and DK	-	European not Eastern
Other and DK	-	Eastern European
European not Eastern	-	East Indian
European not Eastern	-	Asian
European not Eastern	-	Middle-Eastern and Pakistani
European not Eastern	-	Other and DK
European not Eastern	-	Eastern European
Eastern European	-	East Indian
Eastern European	-	Asian
Eastern European	-	Middle-Eastern and Pakistani
Eastern European	-	Other and DK
Eastern European	-	European not Eastern

A few Chisquare tests to predict passed

The FREQ Procedure

Table of course2 by passed

course2 passed(Passed the course)

Frequency| Row Pct	No	Yes	Total
1	44	15	59
	74.58	25.42	
2	149	224	373
	39.95	60.05	
3	8	31	39
	20.51	79.49	
Total	201	270	471

Frequency Missing = 108

Statistics for Table of course2 by passed

Statistic	DF	Value	Prob
Chi-Square	2	33.5096	<.0001
Likelihood Ratio Chi-Square	2	34.4171	<.0001
Mantel-Haenszel Chi-Square	1	31.6717	<.0001
Phi Coefficient		0.2667	
Contingency Coefficient		0.2577	
Cramer's V		0.2667	

Effective Sample Size = 471
Frequency Missing = 108

WARNING: 19% of the data are missing.

Table of sex by passed

sex	passed(Passed the course)		
Frequency Row Pct	No	Yes	Total
Female	118 44.36	148 55.64	266
Male	138 48.42	147 51.58	285
Total	256	295	551

Frequency Missing = 28

A few Chisquare tests to predict passed

The FREQ Procedure

Statistics for Table of sex by passed

Statistic	DF	Value	Prob
Chi-Square	1	0.9118	0.3396
Likelihood Ratio Chi-Square	1	0.9122	0.3395
Continuity Adj. Chi-Square	1	0.7559	0.3846
Mantel-Haenszel Chi-Square	1	0.9101	0.3401
Phi Coefficient		-0.0407	
Contingency Coefficient		0.0406	
Cramer's V		-0.0407	

Fisher's Exact Test

Cell (1,1) Frequency (F)	118
Left-sided Pr <= F	0.1923
Right-sided Pr >= F	0.8509
Table Probability (P)	0.0432
Two-sided Pr <= P	0.3484

Effective Sample Size = 551
Frequency Missing = 28

Table of ethnic by passed

ethnic(Judged Nationality of name)
passed(Passed the course)

Frequency Row Pct	No	Yes	Total
Asian	65 49.62	66 50.38	131
Eastern European	30 47.62	33 52.38	63
European not Eastern	88 45.13	107 54.87	195
Middle-Eastern and Pakistani	33 45.83	39 54.17	72
East Indian	31 39.74	47 60.26	78
Other and DK	27 67.50	13 32.50	40
Total	274	305	579

The FREQ Procedure

Statistics for Table of ethnic by passed

Statistic	DF	Value	Prob
Chi-Square	5	9.0500	0.1071
Likelihood Ratio Chi-Square	5	9.1556	0.1030
Mantel-Haenszel Chi-Square	1	0.0788	0.7789
Phi Coefficient		0.1250	
Contingency Coefficient		0.1241	
Cramer's V		0.1250	

Sample Size = 579

Table of tongue by passed

tongue(Mother Tongue (Eng or Other)) passed(Passed the course)

Frequency / Row Pct	No	Yes	Total
English	187 46.52	215 53.48	402
Other	69 46.31	80 53.69	149
Total	256	295	551

Frequency Missing = 28

The FREQ Procedure

Statistics for Table of tongue by passed

Statistic	DF	Value	Prob
Chi-Square	1	0.0019	0.9652
Likelihood Ratio Chi-Square	1	0.0019	0.9652
Continuity Adj. Chi-Square	1	0.0000	1.0000
Mantel-Haenszel Chi-Square	1	0.0019	0.9652
Phi Coefficient		0.0019	
Contingency Coefficient		0.0019	
Cramer's V		0.0019	

Fisher's Exact Test

Cell (1,1) Frequency (F)	187
Left-sided Pr <= F	0.5552
Right-sided Pr >= F	0.5214
Table Probability (P)	0.0765
Two-sided Pr <= P	1.0000

Effective Sample Size = 551
Frequency Missing = 28

Median tests

The FREQ Procedure

Table of course2 by gsplit

course2 gsplit(Median split on final grade)

Frequency Row Pct	60orLess	Over60	Total
1	15 62.50	9 37.50	24
2	145 50.88	140 49.12	285
3	17 45.95	20 54.05	37
Total	177	169	346

Frequency Missing = 233

Statistics for Table of course2 by gsplit

Statistic	DF	Value	Prob
Chi-Square	2	1.6469	0.4389
Likelihood Ratio Chi-Square	2	1.6623	0.4356
Mantel-Haenszel Chi-Square	1	1.4261	0.2324
Phi Coefficient		0.0690	
Contingency Coefficient		0.0688	
Cramer's V		0.0690	

Effective Sample Size = 346
Frequency Missing = 233

WARNING: 40% of the data are missing.

Table of sex by gsplit

sex	gsplit(Median split on final grade)		
Frequency Row Pct	60orLess	Over60	Total
Female	106 54.92	87 45.08	193
Male	99 52.11	91 47.89	190
Total	205	178	383

Frequency Missing = 196

Median tests

The FREQ Procedure

Statistics for Table of sex by gsplit

Statistic	DF	Value	Prob
Chi-Square	1	0.3054	0.5805
Likelihood Ratio Chi-Square	1	0.3055	0.5805
Continuity Adj. Chi-Square	1	0.2027	0.6526
Mantel-Haenszel Chi-Square	1	0.3046	0.5810
Phi Coefficient		0.0282	
Contingency Coefficient		0.0282	
Cramer's V		0.0282	

Fisher's Exact Test

Cell (1,1) Frequency (F)	106
Left-sided Pr <= F	0.7438
Right-sided Pr >= F	0.3263
Table Probability (P)	0.0701
Two-sided Pr <= P	0.6092

Effective Sample Size = 383
Frequency Missing = 196

WARNING: 34% of the data are missing.

Median tests

The FREQ Procedure

Table of ethnic by gsplit

ethnic(Judged Nationality of name)
gsplit(Median split on final grade)

Frequency Row Pct	60orLess	Over60	Total
Asian	41 47.13	46 52.87	87
Eastern European	27 58.70	19 41.30	46
European not Eastern	86 60.56	56 39.44	142
Middle-Eastern and Pakistani	30 60.00	20 40.00	50
East Indian	17 32.08	36 67.92	53
Other and DK	10 66.67	5 33.33	15
Total	211	182	393

Frequency Missing = 186

Statistics for Table of ethnic by gsplit

Statistic	DF	Value	Prob
Chi-Square	5	16.4443	0.0057
Likelihood Ratio Chi-Square	5	16.6079	0.0053
Mantel-Haenszel Chi-Square	1	0.1169	0.7324
Phi Coefficient		0.2046	
Contingency Coefficient		0.2004	
Cramer's V		0.2046	

Effective Sample Size = 393
Frequency Missing = 186

WARNING: 32% of the data are missing.

Median tests

The FREQ Procedure

Table of tongue by gsplit

tongue(Mother Tongue (Eng or Other))
gsplit(Median split on final grade)

Frequency Row Pct	60orLess	Over60	Total
English	165 57.09	124 42.91	289
Other	40 42.55	54 57.45	94
Total	205	178	383

Frequency Missing = 196

Statistics for Table of tongue by gsplit

Statistic	DF	Value	Prob
Chi-Square	1	6.0283	0.0141
Likelihood Ratio Chi-Square	1	6.0242	0.0141
Continuity Adj. Chi-Square	1	5.4579	0.0195
Mantel-Haenszel Chi-Square	1	6.0125	0.0142
Phi Coefficient		0.1255	
Contingency Coefficient		0.1245	
Cramer's V		0.1255	

Fisher's Exact Test

Cell (1,1) Frequency (F)	165
Left-sided Pr <= F	0.9950
Right-sided Pr >= F	0.0098
Table Probability (P)	0.0047
Two-sided Pr <= P	0.0171

Effective Sample Size = 383
Frequency Missing = 196

WARNING: 34% of the data are missing.